

WHAT IS CLAIMED IS:

1. An implantable device for semiautomatic suturing using a surgical thread, the suturing enabling biological and/or artificial tissues to be united, the device
5 comprising: blocking means enabling two strands of the thread of a suture to be connected together in a blocking zone; a bearing element having a bearing surface for bearing against the tissues to be sutured together; and controlled tensioning means for applying controlled
10 tensioning to said thread, and suitable, after the two strands of said thread have been blocked together using said blocking means, for exerting a tension at a first predetermined tension value, with the junction between said bearing element and said blocking zone of the device
15 being provided by said controlled tensioning means.
2. A device according to claim 1, wherein the blocking of said strands of thread using said blocking means is suitable for automatically triggering said tensioning of
20 the threads to a said predetermined tension value, preferably lying in the range 0.1 N to 10 N.
3. A suture device according to claim 1, wherein said controlled tensioning means enable the distance between
25 said blocking zone and said contact zone in contact with the tissue to be adjusted between:
 - an initial distance in which said two ends of the strands of thread can be blocked together with the thread being at a tension that is preferably low; and
 - 30 • a final distance ($L' = L \pm b$) suitable for exerting a said controlled tension having a said first predetermined tension value.
4. A suture device according to claim 3, wherein said
35 tensioning means comprise resilient junction means between said contact zone and said blocking zone so as to

enable the distance between said contact zone and said blocking zone to be adjusted between:

· a controlled initial distance in which the spacing between said contact zone and said blocking zone is

5 controlled by a first link element and/or a first spacer element, and said initial distance corresponding to a distance in which said blocking zone and said contact zone are in a close-together position by applying compression compared with a spaced-apart, rest position

10 ($L + a$); and

· said final adjusted distance ($L' = L \pm b$) corresponds to a position of force equilibrium in which the distance between said contact zone and said blocking zone is no longer controlled by a said first link element

15 and/or a said first spacer element.

5. A device according to claim 4, wherein said initial distance between said blocking zone and said contact zone can be obtained using a first link element suitable for

20 initially connecting said blocking zone and said contact zone of the device, and said final distance ($L' = L \pm b$) of said first blocking zone relative to said first contact zone can be implemented by releasing said first link element.

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6. A device according to claim 5, wherein said first link element is suitable for co-operating with said blocking means in such a manner that said first link element is released once said strands of thread have been blocked

30 together using said blocking means.

7. A suture device according to claim 4, wherein said device is suitable for co-operating with a placing instrument to which it is secured, preferably via a top portion corresponding to said blocking zone in such a manner that:

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· prior to said bearing surface coming into contact with said tissue, said resilient junction means are at rest, and said bearing surface and said A blocking zone are in a spaced-apart position;

5 · when said contact zone is pressed against said tissue for suturing, said resilient junction means are put into compression and the distance between said contact zone and said blocking zone decreases to a said initial distance controlled by a said first minimum
10 spacer element, which element is preferably secured to said instrument, said bearing surface coming into abutment against said first spacer element of said instrument; and

15 · said final distance is obtained by co-operation between said placing instrument and said device, preferably by separating said placing instrument from said suture device.

20 8. A device according to claim 2, the device being adapted for the thread to be disengaged so as to be capable of being cut between said blocking zone and said suture orifices in said tissue, preferably between said blocking zone and said contact zone.

25 9. A device according to claim 1, including guide means enabling the two strands of thread to be held laterally spaced apart from each other at the suture orifices in said tissue.

30 10. A device according to claim 9, wherein said guide means comprise at least one notch made in said bearing surface defining said contact zone.

35 11. A device according to claim 10, wherein said guide means comprise, on an under-face of a said notch, a piece of fabric of biocompatible material suitable for being

pierced by said two strands of thread in order to keep them spaced apart.

12. A device according to claim 4, the device being U-shaped, comprising:

- a bottom first branch defining a said bearing surface for bearing against said tissue, and including said contact zone;

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- a top second branch including said blocking zone and secured with or co-operating with said blocking means; and

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- a junction element between said first and second branches, the junction element being made of a semirigid material presenting a said elasticity, preferably being a curved junction element providing a hairpin junction between said first and second branches.

13. A device according to claim 4, the device being constituted by:

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- a first plate defining a said bearing surface for bearing on said tissue, and including said contact zone;
- a second plate including said blocking zone; and
- said first and second plates being connected together by a junction element comprising a resilient spring wire or spring blade.

14. A device according to claim 13, wherein:

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- said spring wire defines a frustoconical envelope;
- said first plate is placed at the end of said spring beside the large base of said truncated cone formed by said spring;
- said second plate is placed at the end of said spring that is beside the small base of said truncated cone formed by said spring; and

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- preferably, said spring is suitable for being received in its own empty central space when it is

compressed by moving said first and second plates towards each other.

15. A device according to claim 1, wherein said blocking
5 means comprise two blocking surfaces capable of moving
between a spaced-apart position in which it is possible
to insert said strands of thread between said two
blocking surfaces, and suitable for blocking said strands
of thread together by friction between the threads and
10 said two blocking surfaces once the surfaces are in a
close-together, blocking position, the displacement of
said two surfaces between said spaced-apart position and
said close-together position automatically triggering
said tensioning of the threads after blocking.

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16. A device according to claim 15, wherein said blocking
of the strands of thread using said blocking means is
suitable for being triggered automatically.

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17. A device according to claim 16, wherein the automatic
triggering of the blocking of said strands of thread
using said blocking means take place when the device is
pressed into contact with the tissues to be sutured
together with a bearing force that is greater than a
25 second predetermined value, preferably lying in the range
0.2 N to 20 N, and more preferably greater than 10 N.

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18. A device according to claim 15, wherein said blocking
means comprise two jaws resiliently connected together
and forming respective ones of said blocking surfaces
which are held apart by a second spacer element, said
second spacer element being suitable for being released
by being disengaged or broken so as to enable said
blocking surfaces to move towards each other and block
35 said strands of thread together.

19. A device according to claim 18, wherein said second spacer element is suitable for being released automatically, preferably by pressing said placing instrument against said second spacer element while said bearing surface of the device is exerting pressure on the tissues that is greater than a second determined value, preferably lying in the range 0.2 N to 20 N, and more preferably not less than 10 N.
- 10 20. A device according to claim 17, wherein said second spacer element is suitable for being released by automatically triggering release of said first link element between said blocking zone and said contact zone of the device so that said zones adopt a said final 15 distance ($L' = L \pm b$) that is adjusted to allow a said first controlled tension value to be exerted on said strands of thread.
- 20 21. A device according to claim 1, wherein said bearing element, said blocking means, and said controlled tensioning means form a single one-piece mechanical part.